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09/686,408	10/11/2000	LI YANG	791_119	6047
25191	7590	05/26/2004	EXAMINER	
BURR & BROWN PO BOX 7068 SYRACUSE, NY 13261-7068			CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 05/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AC

**Office Action Summary****Application No.**

09/686,408

**Applicant(s)**

YANG ET AL.

**Examiner**

Gregg Cantelmo

**Art Unit**

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 May 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,9 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,9 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. In response to the amendment received May 10, 2004:
  - a. Claims 3 and 4 have been cancelled. Claims 1, 2, 9 and 10 are pending;
  - b. The prior art rejections stand;
  - c. The obviousness double patenting rejection stands.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1, 2, 9 and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 11-135152-A (JP '152).

JP '152 discloses a lithium secondary battery (abstract) comprising: an electrode body obtained by winding the electrodes and separator (Fig. 1), a non-aqueous electrolytic solution containing a lithium compound (abstract), a positive electrode comprising lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub> which has an inherent spinel structure) containing lithium and manganese as the main components of the positive electrode active material (translated paragraphs [0022]), a negative electrode comprising graphitized carbon powder as the negative electrode active material (translated

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paragraph [0027]), wherein the total HF concentration is less than 300 ppm (abstract) and especially 150 ppm or less (translated paragraph [0007]). The moisture content is less than 300 ppm, and especially 100 ppm or less (translated paragraph [0017] as applied to claim 1).

The lithium compound is lithium hexafluorophosphate (paragraph [0010] as applied to claim 2).

The positive electrode comprises lithium manganese oxide of a spinel structure containing lithium and manganese as the main components of the positive electrode active material (translated paragraphs [0022]).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 91 1 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 562 F.2d at 1255, 195 USPQ at 433. See also Titanium Metals Corp. v. Banner, 778 F.2d 775, 2: USPQ 773 (Fed. Cir. 1985). See also MPEP § 2112.01 (as applied to claim 9).

With respect to claim 10, claim 10 recites an intended use without positively reciting any additional structure to the battery. The prior art structure of JP '152

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is capable of performing the intended use as recited in claim 10, thus it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The limitations of claim 10 reciting the purpose or intended use of the battery of claim 1, does not positively set forth any structural differences between the claimed invention and the prior art.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See also MPEP § 2114.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1-2 and 9-10 have been considered but are moot in view of the new ground(s) of rejection.

JP '152 discloses that it is desired in the art to minimize the HF acid content and moisture content in a non-aqueous lithium secondary battery to improve the storage life and capacity of the battery.

The HF content is especially below 100 ppm as is the moisture content (as set forth above). Thus the total content is especially below 200 ppm for both HF and water.

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This is not exceed three years after sealing (abstract). Since each of these values are remarkably less than the threshold established in claim 1, and since the prior art discloses the desire to maintain these low contents over a prolonged period of time, there is a reasonable expectation that after 20,000 cycles the prior art battery will still exhibit a combined HF and water total concentration of less than 10,000 ppm.

Furthermore by controlling the water content in the cell at the time the cell is formed, this will control the amount of HF formed over the duration of operation since water is a reactant that degrades the electrolyte salt and generates HF. Limiting the moisture content in the cell as recognized by JP '152 will effectively limit the amount of HF that can be generated in the cell over time.

JP '152 recognized that the cause of deterioration of a rechargeable battery with the passage of time considers decay of the structure of the electrode material by the repeat of charge and discharge, disassembly of the electrolyte in the severe oxidation reduction condition in an electrode interface, the time of cell assembly, the effect of moisture which invades from the obturation section after that, etc. While development of an electrode material with sufficient shelf life and selection of a suitable electrolyte are performed, the attempt which lessens the moisture content in a cell is also performed wholeheartedly. Since existence of moisture makes the lithium salt in an electrolyte decompose, the moisture management like a cell assembler is important preferably for example, the electrode sheet of positive/negative is heat-treated before cell assembly, and, usually sufficient dehydration is performed. Moreover, it assembles, after cell assembly materials, such as a cell can, are also dehydrated, and it is put on a

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production process. Moreover, it is manufactured using the raw material which also dehydrated the electrolyte, and, usually dehydration is repeated by cell assembly (JP '152 paragraph [003]).

Thus JP '152 recognized that minimizing the initial moisture content in all of the constituents of the battery is required to minimize the concentration of HF that can form over time due to the presence of moisture in the cell prior to obturation.

The HF content does not exceed 300 ppm over three years and is due to the fact that the moisture content and HF content were initially minimized in the cell at the time the cell was packaged.

After washing the cell components and fully dehydrating them before assembly, the components are kept in a moisture free air or inert atmosphere and the cell is assembled in the same moisture free atmosphere to eliminate condensation from adhering to the cell components during manufacturing (JP '152 paragraphs [0018]-[0021]).

It is clear that the prior art of JP '152 takes great measures to minimize the initial moisture content in the cell prior to obturation (closing the cell) and thus effectively minimizes a critical reactant necessary for forming HF. By minimizing the moisture content in the cell and as well minimizing the HF content in the cell and sealing the cell from ambient, there is reasonable expectation that the prior art cell will inherently maintain a combined HF and moisture content of less than 10,000 ppm for 20,000 cycles.

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Applicant's arguments on page 6 of the amendment is not persuasive since it fails to show how the LiPF<sub>6</sub> salt is decomposed to arrive at the reactant PF<sub>6</sub> needed to generate HF. One of ordinary skill in the art would have recognized that water is a critical reactant in the battery which causes the degradation of LiPF<sub>6</sub> (see paragraph [003] of JP '152) and thus by controlling the moisture content within the battery, which JP '152 takes particular detail in describing, the amount of HF formed will be minimized.

The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP § 2112.01 with regard to inherency and product-by-process claims and MPEP § 2141.02 with regard to inherency and rejections under 35 U.S.C. 103.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977).

Applicant is required to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote



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omitted].” The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

### ***Claim Rejections - 35 USC § 103***

5. Claims 1, 2, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP ‘361 in view of JP ‘152, Iwata (of record), and Ejiri.

JP ‘631 discloses a lithium secondary battery comprising: an electrode body having a positive electrode 5 and a negative electrode 4 disposed about opposite sides of separator 3 (Fig. 1). While the language of winding or laminating is a process step and not held to further limit the end product, the electrode body as shown in Fig. 1 is wound (see page 10 of the uncertified translation of JP ‘631, in particular paragraph [0077]); a non-aqueous electrolytic solution containing a lithium salt (lithium compound) wherein the electrolytic solution contains water and hydrofluoric acid in a total maximum concentration of 150 ppm or less. The moisture content of the whole cell 2000 ppm or less and preferably 500 ppm or less and absent clear evidence to the contrary will have a total content less than 10,000 ppm after 20,000 cycles (abstract and paragraph [0073] as applied to claim 1).

The lithium compound is LiPF<sub>6</sub> (page 3 of translation, paragraph [0027] as applied to claim 2).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical

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processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 91 1 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 562 F.2d at 1255, 195 USPQ at 433. See also Titanium Metals Corp. v. Banner, 778 F.2d 775, 2: USPQ 773 (Fed. Cir. 1985). See also MPEP § 2112.01 (as applied to claim 9).

With respect to claim 10, claim 10 recites an intended use without positively reciting any additional structure to the battery. The prior art structure of JP '152 is capable of performing the intended use as recited in claim 10, thus it meets the claim. See, e.g., In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The limitations of claim 10 reciting the purpose or intended use of the battery of claim 1, does not positively set forth any structural differences between the claimed invention and the prior art.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference

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as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See also MPEP § 2114.

The differences between the instant claims and JP '631 are that JP '631 does not appear to disclose lithium manganese oxide of cubic system spinel structure containing lithium and manganese as the main components used as the positive electrode active substance (as recited in both claim 1) and of a negative electrode active material of graphite (claim 1).

With respect to using lithium manganese oxide materials and graphite materials in a lithium secondary battery:

JP '631 discloses a multitude of positive and negative electrode materials which are known to be used in conjunction with plural lithium salt electrolytes (see paragraphs [0010], [0022] and [0027]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '631 by using any combination of the electrode and electrolyte materials known in the art for use as such since they would have provided a combination which effectively generates electrical energy. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v.*

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Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227

F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07

With respect to the particular use of lithium manganese oxide materials as the positive electrode active substance is well described in the art (claim 1).

The lithium-manganese oxide material is of high performance from the viewpoint of electrochemistry because of its increased discharge capacity and high stability in discharge capacity after repeated charge/discharge cycles, when used as an active material for a positive electrode in lithium secondary batteries. When the lithium-manganese oxide of the invention is used as an active material for a positive electrode in a lithium secondary battery, it is possible to operate the battery in an output voltage range as high as from 3.5 volts to 4.5 volts with an increased discharge capacity and a high stability in discharge capacity even after repeated charge/discharge cycles. These advantages have not been achieved by conventional Li-Mn oxides. It should also be appreciated that the present Li-Mn oxide can be packed efficiently so that this could lead to a lithium secondary battery having a relatively high capacity (Iwata, col. 15, ll. 4-30).

The motivation for selecting the positive electrode active material to be lithium manganese oxide of cubic system spinel structure containing lithium and manganese as the main components is that it has increased discharge capacity and high stability in discharge capacity after repeated charge/discharge cycles, when used as an active material for a positive electrode in lithium secondary batteries.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '631 by selecting the positive electrode active material to be lithium manganese oxide of cubic system spinel structure containing lithium and manganese as the main components since it would have manufactured a battery having increased discharge capacity and high stability in discharge capacity after repeated charge/discharge cycles, when used as an active material for a positive electrode in lithium secondary batteries.

Furthermore, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to the particular use of graphite as the negative electrode active material (claim 1):

Use of highly graphitized carbon fibers in negative electrodes is desired due to graphite's large charge and discharge capacities (Ejiri col. 5, line 54 through col. 6, line 5). Furthermore, Ejiri discloses that the graphitized carbon negative electrode can be employed in a lithium secondary battery wherein the lithium electrolyte is LiPF<sub>6</sub> and the positive electrode is LiMnO (col. 14, ll. 65 through col. 15, line 10).

The motivation for using highly graphitized carbon fiber as the negative electrode active substance is that it would have provided a negative electrode having improved charge and discharge capacities.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '631 by using highly graphitized carbon fiber as the negative electrode active substance since it would have provided a negative electrode having improved charge and discharge capacities.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 1-2 and 9-10 have been considered but are moot in view of the new ground(s) of rejection.

JP '152 discloses that it is desired in the art to minimize the HF acid content and moisture content in a non-aqueous lithium secondary battery to improve the storage life and capacity of the battery.

The HF content is especially below 100 ppm as is the moisture content (as set forth above). Thus the total content is especially below 200 ppm for both HF and water. This is not exceed three years after sealing (abstract). Since each of these values are remarkably less than the threshold established in claim 1, and since the prior art discloses the desire to maintain these low contents over a prolonged period of time, there is a reasonable expectation that after 20,000 cycles the prior art battery will still exhibit a combined HF and water total concentration of less than 10,000 ppm.

Furthermore by controlling the water content in the cell at the time the cell is formed, this will control the amount of HF formed over the duration of operation since water is a reactant that degrades the electrolyte salt and generates HF. Limiting the

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moisture content in the cell as recognized by JP '152 will effectively limit the amount of HF that can be generated in the cell over time.

JP '152 recognized that the cause of deterioration of a rechargeable battery with the passage of time considers decay of the structure of the electrode material by the repeat of charge and discharge, disassembly of the electrolyte in the severe oxidation reduction condition in an electrode interface, the time of cell assembly, the effect of moisture which invades from the obturation section after that, etc. While development of an electrode material with sufficient shelf life and selection of a suitable electrolyte are performed, the attempt which lessens the moisture content in a cell is also performed wholeheartedly. Since existence of moisture makes the lithium salt in an electrolyte decompose, the moisture management like a cell assembler is important preferably for example, the electrode sheet of positive/negative is heat-treated before cell assembly, and, usually sufficient dehydration is performed. Moreover, it assembles, after cell assembly materials, such as a cell can, are also dehydrated, and it is put on a production process. Moreover, it is manufactured using the raw material which also dehydrated the electrolyte, and, usually dehydration is repeated by cell assembly (JP '152 paragraph [003]).

Thus JP '152 recognized that minimizing the initial moisture content in all of the constituents of the battery is required to minimize the concentration of HF that can form over time due to the presence of moisture in the cell prior to obturation.

The HF content does not exceed 300 ppm over three years and is due to the fact that the moisture content and HF content were initially minimized in the cell at the time the cell was packaged.

After washing the cell components and fully dehydrating them before assembly, the components are kept in a moisture free air or inert atmosphere and the cell is assembled in the same moisture free atmosphere to eliminate condensation from adhering to the cell components during manufacturing (JP '152 paragraphs [0018]-[0021]).

It is clear that the prior art of JP '152 takes great measures to minimize the initial moisture content in the cell prior to obturation (closing the cell) and thus effectively minimizes a critical reactant necessary for forming HF. By minimizing the moisture content in the cell and as well minimizing the HF content in the cell and sealing the cell from ambient, there is reasonable expectation that the prior art cell will inherently maintain a combined HF and moisture content of less than 10,000 ppm for 20,000 cycles.

Applicant's arguments on page 6 of the amendment is not persuasive since it fails to show how the LiPF<sub>6</sub> salt is decomposed to arrive at the reactant PF<sub>6</sub> needed to generate HF. One of ordinary skill in the art would have recognized that water is a critical reactant in the battery which causes the degradation of LiPF<sub>6</sub> (see paragraph [003] of JP '152) and thus by controlling the moisture content within the battery, which JP '152 takes particular detail in describing, the amount of HF formed will be minimized.



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The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP § 2112.01 with regard to inherency and product-by-process claims and MPEP § 2141.02 with regard to inherency and rejections under 35 U.S.C. 103.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977).

Applicant is required to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

### ***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

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unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-2 and 9-10 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 12 of copending Application No. 09/770,725 in view of either JP '361, DE 198 27 631 A1 (DE '631), or WO 99/34471 (WO '471).

For claim review purposes, the examiner has cited U.S. patent Application Publication No. US 2001/0016291 A1 which is the published application of copending Application No. 09/770,725.

Copending Application No. 09/770,725 claims a lithium secondary battery comprising: an electrode unit produced by winding or laminating a positive electrode and a negative electrode via a separator, and a non-aqueous electrolytic solution containing a lithium compound as an electrolyte (copending claim 1 as applied to claim 1).

The lithium compound is lithium hexafluorophosphate (copending claim 2 as applied to claim 2).

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A lithium manganese oxide containing lithium and manganese as the main components and having a cubic system spinel structure is used as the positive electrode (copending claims 3 and 4).

A highly graphitized carbon fiber filler is used as the negative electrode active substance (copending claims 5-7).

The lithium secondary battery has a battery capacity of 2 Ah or more (copending claim 8).

The battery is used in an electric automobile or a hybrid electric automobile (copending claim 12).

The difference between the instant claims and copending claim 1 is that the copending claim 1 does not recite that the non-aqueous electrolytic solution containing a lithium salt (lithium compound) wherein the electrolytic solution contains water and hydrofluoric acid in a total maximum concentration of 10,000 ppm or less.

The concept of reducing the water and hydrogen fluoride concentration in a non-aqueous electrolytic solution of a lithium secondary battery is well documented in the art as shown by either JP '361, DE '631 or WO '471.

More particularly JP '361 discloses of a non-aqueous electrolytic solution having a maximum water and HF (hydrofluoric acid) concentration of 150 ppm or less (abstract). DE '631 similarly discloses removing water and hydrogen fluoride from the non-aqueous electrolytic solution to a water concentration of less than 10 ppm and an HF acid concentration less than 30 ppm (abstract). And further WO '471 discloses of removing water and hydrogen fluoride from the non-aqueous electrolytic solution to a

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water concentration of not more than 3 ppm and an acid level of not more than 1 ppm (abstract),

Each of these references recognized that the battery charge and discharge capacity is improved when the water and acid content is reduced in the electrolytic solution (JP '361 abstract; DE '631 abstract WO '471 abstract).

The motivation for reducing the water and HF content in copending Application No. 09/770,725 is to improve the charge and discharge capacity of the battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the claims of copending Application No. 09/770,725 by selecting the electrolytic solution to have water and HF in a total concentration of 10,000 ppm or less since it would have improved the charge and discharge capacity of the battery.

This is a provisional obviousness-type double patenting rejection.

### ***Response to Arguments***

9. Applicant's arguments filed August 16, 2003 have been fully considered but they are not persuasive.

Applicant expressly defers addressing the double patenting rejection. Therefore the rejection stands.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Gregg Cantelmo  
Primary Examiner  
Art Unit 1745

gc

*Gregg Cantelmo*

May 24, 2004

